

The Challenges of Transitioning to an Enterprise Content Delivery Network

Marine Corps Lessons Learned



In the early days...

- Distributed content
 - AICC courses (~800 course offerings)
 - CD-ROM & intranet delivery
- Distributed learning management services
 - Limited functionality
- Large # of servers
 - High support costs
- Fragile environment
 - Software & network
 - Scalability issues
- 3,000-5,000 students!



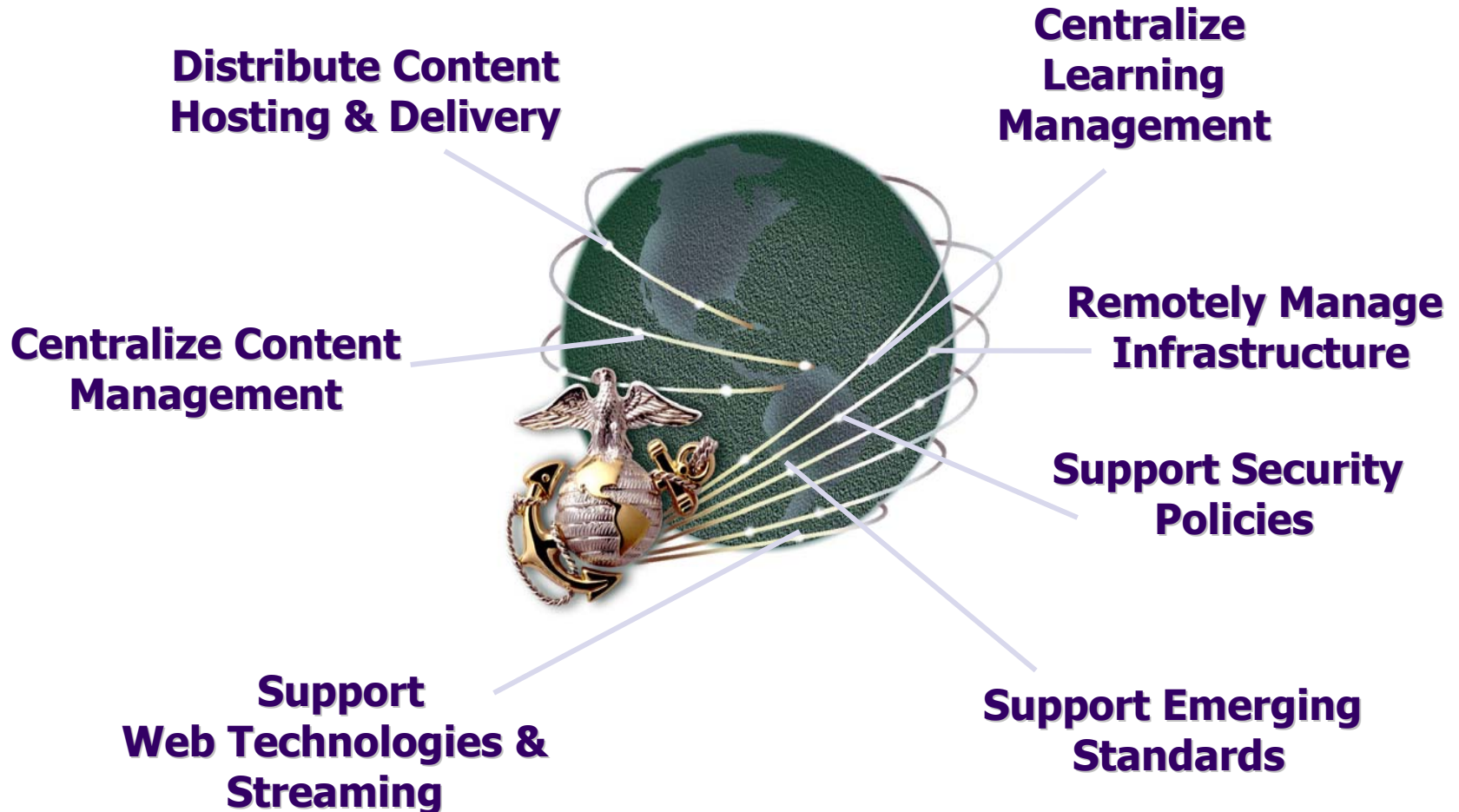
(circa 1998-2001)

What were the challenges?

- Distributed, deployed, and mobile students
- Growing student population
- Wide-area bandwidth
- Security policies
- External system interfaces
- Legacy content
- Standards

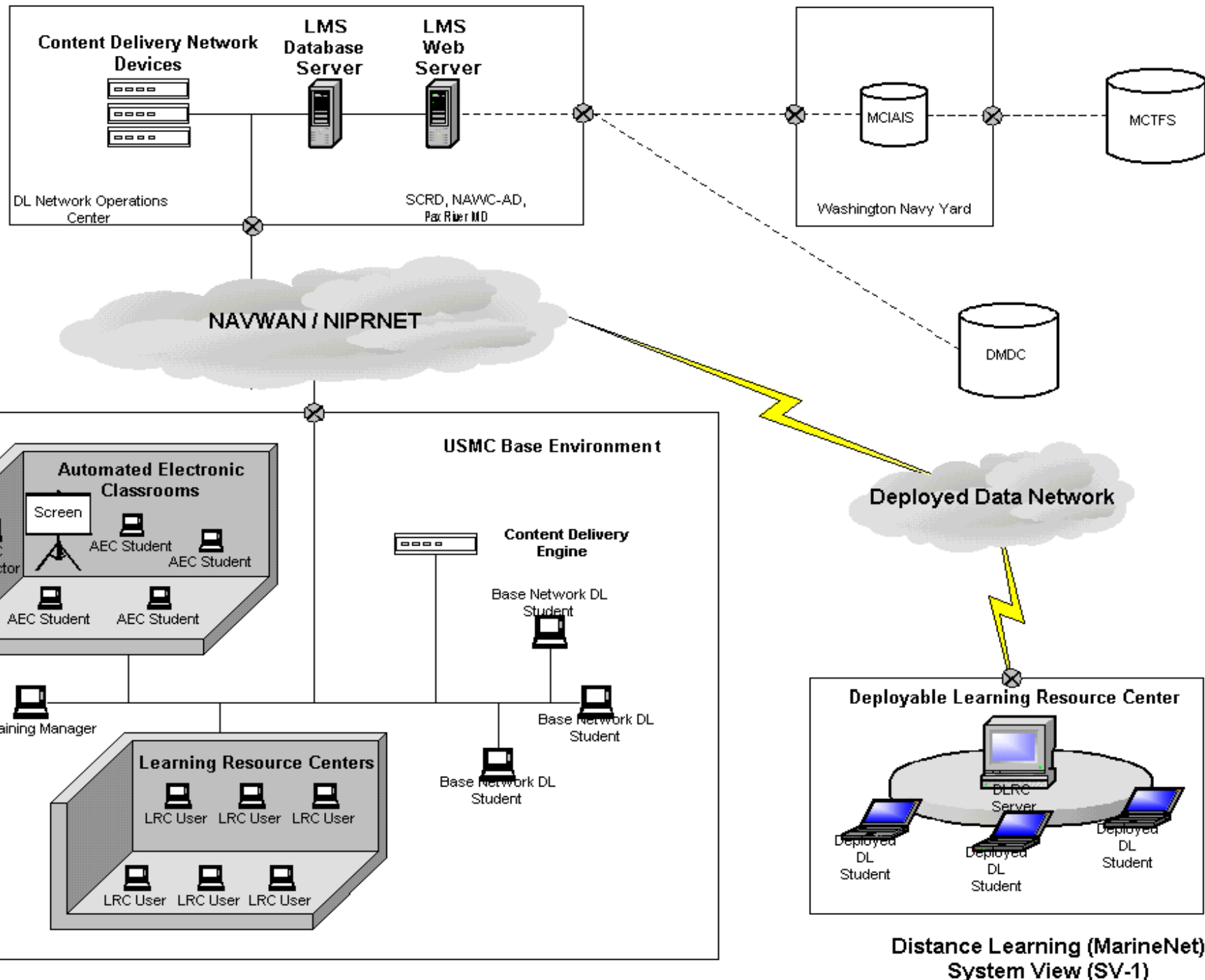
...What was our solution?

An Enterprise Content Delivery Network



What were the implementation goals?

- Goal #1. Deploy a centralized COTS Learning Management System (LMS)
- Goal #2. Deliver high quality, media-rich, interactive web-based content
- Goal #3. Implement a content management and delivery system to control configuration and distribution costs



Learning Management System

- Commercial-off-the-shelf enterprise software
- Web-based user interface
- Multi-database support
- Standards support (AICC & SCORM)
- Infrastructure compatibility
- Standalone operation for deployable systems
- Testing
- Reporting
- External system interfaces
- Prototype testing before purchase

Goal #1

Learning Management System

- ThinQ Training Server using IIS, Coldfusion, & Oracle
- Customizations:
 - User roles, business rules, and system configuration
 - External user authentication
 - Interface modifications
 - Security modifications
 - Data synchronization

Lessons Learned

- Have detailed requirements
- Know your environment
- Do your homework
 - Understand the standards
 - Conduct market research
- Don't rely on demos – test!
- Get your users involved
- Manage the customizations!
- Integration is hard...
 - External systems
 - Deployable environment

Goal #2

Interactive Web-based Content

- Integrating content
 - Launch links & redirection
- AICC retrofit of legacy content
 - API
- Testing workstation configurations
 - Plug-ins
 - Persistent cookies
- Content distribution
 - Content Directory Structure

Lessons Learned

- Explicit technical guidelines
- Standards are great if understood & followed!
- Software baseline and CM are key!
- Security is hard...
 - Firewall configurations
 - Mobile code policy & interactivity
 - Managed desktops environments

Enterprise Content Delivery Network

- Replace existing content servers with low cost network appliances
- Commercial-off-the-shelf hardware/software solution
- Overlay onto existing USMC Enterprise Network
- Comply with USMC security policies
- Integrate with the centralized LMS
- Provide centralized mgmt with distributed delivery
- Support delivery of interactive and streamed content

Goal #3

Implement an Enterprise Content Delivery Network

- CDN Model
 - Stored centrally
 - Distributed remotely
 - Delivered locally
- LMS provides user interface
 - Course launch request
- Redirection Process
 - Select closest CDE
- Content Delivery
 - Content via LAN
 - Communicate with LMS
- Content distribution
 - Published from master repository

Lessons Learned

- All components critical
- Overlay network integration is very complex and risky
 - Firewalls, proxies, domains
 - Cross enclave communications
 - Security policies
 - CDN hosting issues
- Vendor viability and risk
- Distribution versus Delivery

Conclusions.....

- Critical Success Factors are Numerous
 - Clear Operational and Technical Requirements
 - Standards Definition and Adherence
 - Software Baselines and Configuration Management
 - System Integration and Testing
- Solution is a System of Systems
 - Composite of products, engineering, and organizations
- Integration and Testing
 - Seldom works right the first time
 - Complex, time consuming but essential
- Integrated Management and Engineering Team
 - Focused, Collaborative Teamwork

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